

AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. *(currently amended)* A driving apparatus ~~of~~ for a liquid crystal display apparatus, comprising:

first and second amplifier circuits that amplify a noninverted input signal or an inverted input signal; a first changeover circuit that selectively switches and outputs the noninverted and inverted input signals to be outputted to the first and second amplifier circuits;

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a second changeover circuit that selectively switches and outputs output signals of the respective first and second amplifier circuits to pixels provided in a matrix manner in accordance with an alternation signal; and

a changeover control circuit that controls switching of the first and second changeover circuits so that a polarity of an offset voltage to be applied to the pixel by the first and second changeover circuits is changed for every predetermined number of frames and the offset voltage is canceled by frames whose number is twice as many as the predetermined number of frames.

2. *(currently amended)* The driving apparatus as set forth in claim 1, wherein the changeover control circuit counts horizontal synchronizing signals or signals each of which is outputted for every horizontal synchronizing period, controls the switching of the first changeover circuit in accordance with a first changeover signal that has been subjected to frequency division so that an

integral multiple of a value thus counted is not equal to the number of horizontal lines, and discriminates whether the number of the horizontal lines is an even number or an odd number and generates, in accordance with a result thus discriminated and a vertical synchronizing signal, ~~the~~ a second changeover signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period so as to control the switching of the second changeover circuit in accordance with the second changeover signal.

3. (previously presented) The driving apparatus as set forth in claim 2, wherein the changeover control circuit includes:

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a first frequency divider circuit that outputs the first changeover signal;

a second frequency divider circuit that outputs the signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period;

a third frequency divider circuit that outputs a signal which varies in synchronization with the vertical synchronizing signal;

a logical product circuit that conducts logical product operation with respect to the discriminated result indicative of whether the number of the horizontal lines is an even number or an odd number and an output signal of the third frequency divider circuit; and


an exclusive OR circuit that conducts exclusive OR operation with respect to the output signal of the logical product

circuit and an output signal of the second frequency divider circuit, and generates the second changeover signal.

4. (currently amended) A driving apparatus ~~of~~ for a liquid crystal display apparatus, comprising:

first and second amplifier circuits that amplify a noninverted input signal or an inverted input signal;

a first changeover circuit that selectively switches and outputs the noninverted and inverted input signals to be outputted to the first and second amplifier circuits;

 a second changeover circuit that selectively switches and outputs output signals of the respective first and second amplifier circuits to pixels provided in a matrix manner in accordance with an alternation signal; and

a changeover control circuit that controls switching of the first and second changeover circuits so that a polarity of an offset voltage to be applied to the pixel is changed for every 2m frames and the offset voltage is canceled by 4m frames, where m is a natural number.

5. (currently amended) The driving apparatus as set forth in claim 4, wherein the changeover control circuit controls the switching of the first changeover circuit in accordance with a ~~third~~ first changeover signal that is a resultant of frequency division in which a frequency of ~~the~~ a vertical synchronizing signal is divided so as to be $1/2m$, discriminates whether ~~the~~ a number of ~~the~~ horizontal lines is an even number or an odd number, generates, in accordance with a result thus discriminated and ~~the~~ a

vertical synchronizing signal, ~~the~~ a second changeover signal that varies in synchronization with a signal that is outputted for, every horizontal synchronizing signal or for every horizontal synchronizing period, and controls the switching of the second changeover circuit in accordance with the second changeover signal.

6. (currently amended) The driving apparatus as set forth in claim 5, wherein the changeover control circuit includes:

a ~~fourth~~ first frequency divider circuit that outputs the ~~third~~ first changeover signal;

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a ~~fifth~~ second frequency divider circuit that outputs the signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period;

a logical product circuit that conducts logical product operation with respect to the discriminated result indicative of whether the number of the horizontal lines is an even number or an odd number and a signal that varies in synchronization with the vertical synchronizing signal; and

an exclusive OR circuit that conducts exclusive OR operation with respect to an output signal of the logical product circuit and an output signal of the ~~fifth~~ second frequency divider circuit, and generates the second changeover signal.

7. (currently amended) A driving method ~~of~~ for a liquid crystal display apparatus, comprising:

Reply to Office Action of March 22, 2004

amplifying a noninverted input signal or an inverted input signal in accordance with first and second amplifier circuits;

selectively switching the in-which noninverted and inverted input signals of the first and second amplifier circuits are switched in accordance with a changeover signal from a first changeover circuit;

selectively switching and outputting and output signals of the first and second amplifier circuits in accordance with a second changeover circuit are switched and outputted to pixels provided in a matrix manner in accordance with an alternation signal; ~~comprising the step of:~~ and

controlling the switching of the first and second changeover circuits in accordance with the changeover signal and the alternation signal so that a polarity of each offset voltage to be applied to the pixel is changed for every predetermined number of frames and so that the offset voltage is canceled by frames whose number is twice as many as the predetermined number of frames.

8. (currently amended) The driving method as set forth in claim 7, wherein ~~the~~ horizontal synchronizing signals or ~~the~~ signals that are outputted for every horizontal synchronizing period are counted, the changeover signal is controlled in accordance with a first changeover signal that has been subjected to frequency division so that an integral multiple of the value thus counted is not equal to the number of ~~the~~ horizontal lines, and it is discriminated whether the number of the horizontal lines is an even number or an odd number and generates, in accordance

with a result thus discriminated and a vertical synchronizing signal, ~~the~~ a second changeover signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period so as to control the alternation signal in accordance with the second changeover signal.

9. (currently amended) A driving method ~~of~~ for a liquid crystal display apparatus, comprising:

amplifying a noninverted input signal or an inverted input signal in accordance with first and second amplifier circuits;

selectively switching in which the noninverted and inverted input signals of the first and second amplifier circuits are switched in accordance with a first changeover signal from a first changeover circuit;

selectively switching and outputting and output signals of the first and second amplifier circuits are switched and outputted in accordance with a second changeover circuit to pixels provided in a matrix manner in accordance with an alternation signal; ~~comprising the step of:~~ and

controlling the switching of the first and second changeover circuits in accordance with the first changeover signal and the alternation signal so that a polarity of an offset voltage to be applied to the pixel is changed for every 2m frames and the offset voltage is canceled by 4m frames, where m is a natural number.

10. (currently amended) The driving method as set forth in claim 9, further comprising ~~the steps of~~:

counting horizontal synchronizing signals or signals each of which is outputted for every horizontal synchronizing period;

controlling the switching of the first changeover circuit in accordance with a ~~the~~ first changeover signal that has been subjected to frequency division so that an integral multiple of a value thus counted is not equal to ~~the~~ a number of horizontal lines; and

discriminating whether the number of the horizontal lines is an even number or an odd number and generates, in accordance with a result thus discriminated and a vertical synchronizing signal, ~~the~~ a second changeover signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period so as to control the switching of the second changeover circuit in accordance with the second changeover signal.

11. (currently amended) The driving method as set forth in claim 9, further comprising ~~the steps of~~:

outputting, by a first frequency divider circuit, the first changeover signal;

outputting, by a second frequency divider circuit, the signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period;

outputting, by a third frequency divider circuit, a signal which varies in synchronization with the vertical synchronizing signal;

conducting, by a logical product circuit, logical product operation with respect to the discriminated result indicative of whether the number of the horizontal lines is an even number or an odd number and an output signal of the third frequency divider circuit; and

conducting, by an exclusive OR circuit, an exclusive OR operation with respect to the output signal of the logical product circuit and an output signal of the second frequency divider circuit, and generating the second changeover signal.

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12. (currently amended) The driving method as set forth in claim 9, further comprising ~~the steps of~~:

discriminating whether ~~the~~ a number of ~~the~~ horizontal lines is an even number or an odd number;

generating, in accordance with a result thus discriminated and ~~the~~ a vertical synchronizing signal, ~~the~~ a second changeover signal that varies in synchronization with a signal that is outputted for, every horizontal synchronizing signal or for every horizontal synchronizing period; and


controlling the switching of the second changeover circuit in accordance with the second changeover signal.

13. (currently amended) The driving method as set forth in claim 9, further comprising ~~the steps of~~:

outputting, by a fourth frequency divider circuit, ~~the~~a third changeover signal;

outputting, by a fifth frequency divider circuit, the signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period;

conducting, by a logical product circuit, logical product operation with respect to ~~(a)~~ the discriminated result indicative of whether the number of the horizontal lines is an even number or an odd number and ~~(b)~~ a signal that varies in synchronization with the vertical synchronizing signal; and

conducting, by an exclusive OR circuit, exclusive OR operation with respect to an output signal of the logical product circuit and an output signal of the fifth frequency divider circuit, and generates the second changeover signal.

14. *(currently amended)* The driving method as set forth in claim 9, wherein ~~(a)~~ the horizontal synchronizing signals or the signals that are outputted for every horizontal synchronizing period are counted, ~~(b)~~ the first changeover signal is controlled in accordance with ~~a first changeover~~ a signal that has been subjected to frequency division so that an integral multiple of the value thus counted is not equal to ~~the~~a number of the horizontal lines, and ~~(c)~~ it is discriminated whether the number of the horizontal lines is an even number or an odd number and generates, in accordance with a result thus discriminated and a vertical synchronizing signal, ~~the~~a second changeover signal that varies in synchronization with the horizontal synchronizing signal or the

signal that is outputted for every horizontal synchronizing period so as to control the alternation signal in accordance with the second changeover signal.

15. (new) A driving method of liquid crystal display apparatus in which noninverted and inverted input signals of first and second amplifier circuits are switched in accordance with a changeover signal and output signals of the first and second amplifier circuits are switched and outputted to pixels provided in a matrix manner in accordance with an alternation signal, comprising the step of:

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wherein horizontal synchronizing signals or signals that are outputted for every horizontal synchronizing period are counted, the changeover signal is controlled in accordance with a first changeover signal that has been subjected to frequency division so that an integral multiple of the value thus counted is not equal to the number of horizontal lines, and it is discriminated whether the number of the horizontal lines is an even number or an odd number and generates, in accordance with a result thus discriminated and a vertical synchronizing signal, a second changeover signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period so as to control the alternation signal in accordance with

the second changeover signal.

16. (new) A driving method of liquid crystal display apparatus in which noninverted and inverted input signals of first and second amplifier circuits are switched in accordance with a changeover signal and output signals of the first and second amplifier circuits are switched and outputted to pixels provided in a matrix manner in accordance with an alternation signal, comprising the step of:

controlling the changeover signal and the alternation signal so that polarity of an offset voltage to be applied to the pixel is changed for every $2m$ frames and the offset voltage is canceled by $4m$ frames, where m is a natural;

counting horizontal synchronizing signals or signals each of which is outputted for every horizontal synchronizing period;

controlling the switching of the first changeover circuit in accordance with the first changeover signal that has been subjected to frequency division so that an integral multiple of a value thus counted is not equal to a number of horizontal lines; and

discriminating whether the number of the horizontal lines is an even number or an odd number and generates, in accordance with a result thus discriminated and a vertical synchronizing signal, a second changeover signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period so as to control the switching of the second changeover circuit in accordance with the second changeover signal.

17. (new) A driving method of liquid crystal display apparatus in which noninverted and inverted input signals of first and second amplifier circuits are switched in accordance with a changeover signal and output signals of the first and second amplifier circuits are switched and outputted to pixels provided in a matrix manner in accordance with an alternation signal, comprising the step of:

controlling the changeover signal and the alternation signal so that polarity of an offset voltage to be applied to the pixel is changed for every $2m$ frames and the offset voltage is canceled by $4m$ frames, where m is a natural number;

outputting, by a first frequency divider circuit, the first changeover signal;

outputting, by a second frequency divider circuit, the signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period;

outputting, by a third frequency divider circuit, a signal which varies in synchronization with the vertical synchronizing signal;

conducting, by a logical product circuit, logical product operation with respect to the discriminated result indicative of whether the number of the horizontal lines is an even number or an odd number and an output signal of the third frequency divider circuit; and

conducting, by an exclusive OR circuit, an exclusive OR operation with respect to the output signal of the logical product

circuit and an output signal of the second frequency divider circuit, and generating the second changeover signal.

18. (new) A driving method of liquid crystal display apparatus in which noninverted and inverted input signals of first and second amplifier circuits are switched in accordance with a changeover signal and output signals of the first and second amplifier circuits are switched and outputted to pixels provided in a matrix manner in accordance with an alternation signal, comprising the step of:

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controlling the changeover signal and the alternation signal so that polarity of an offset voltage to be applied to the pixel is changed for every 2m frames and the offset voltage is canceled by 4m frames, where m is a natural number;

discriminating whether a number of horizontal lines is an even number or an odd number;

generating, in accordance with a result thus discriminated and a vertical synchronizing signal, a second changeover signal that varies in synchronization with a signal that is outputted for, every horizontal synchronizing signal or for every horizontal synchronizing period; and

controlling the switching of the second changeover circuit in accordance with the second changeover signal.

19. (new) A driving method of liquid crystal display apparatus in which noninverted and inverted input signals of first and second amplifier circuits are switched in accordance with a changeover signal and output signals of the first and second

amplifier circuits are switched and outputted to pixels provided in a matrix manner in accordance with an alternation signal, comprising the step of:

controlling the changeover signal and the alternation signal so that polarity of an offset voltage to be applied to the pixel is changed for every 2m frames and the offset voltage is canceled by 4m frames, where m is a natural number;

outputting, by a fourth frequency divider circuit, a third changeover signal;

outputting, by a fifth frequency divider circuit, the signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period;

conducting, by a logical product circuit, logical product operation with respect to the discriminated result indicative of whether the number of the horizontal lines is an even number or an odd number and a signal that varies in synchronization with the vertical synchronizing signal; and

conducting, by an exclusive OR circuit, exclusive OR operation with respect to an output signal of the logical product circuit and an output signal of the fifth frequency divider circuit, and generates the second changeover signal.

20. (new) A driving method of liquid crystal display apparatus in which noninverted and inverted input signals of first and second amplifier circuits are switched in accordance with a changeover signal and output signals of the first and second amplifier circuits are switched and outputted to pixels provided in

a matrix manner in accordance with an alternation signal, comprising the step of:

controlling the changeover signal and the alternation signal so that polarity of an offset voltage to be applied to the pixel is changed for every $2m$ frames and the offset voltage is canceled by $4m$ frames, where m is a natural number,

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mld* wherein horizontal synchronizing signals or signals that are outputted for every horizontal synchronizing period are counted, the first changeover signal is controlled in accordance with a signal that has been subjected to frequency division so that an integral multiple of the value thus counted is not equal to a number of the horizontal lines, and it is discriminated whether the number of the horizontal lines is an even number or an odd number and generates, in accordance with a result thus discriminated and a vertical synchronizing signal, a second changeover signal that varies in synchronization with the horizontal synchronizing signal or the signal that is outputted for every horizontal synchronizing period so as to control the alternation signal in accordance with the second changeover signal.
